

CLAIMS

1. A current drive circuit which supplies a signal current to a node of a driven circuit
5 through a signal line,
wherein a precharge means for supplying a precharge voltage to the node through the
signal line is provided; and
the precharge means has a supply means for supplying the precharge voltage to the node
and the signal line prior to supplying the signal current.
10
2. The current drive circuit according to claim 1,
wherein the precharge means comprises a setting means for setting the precharge
voltage to a potential equal to or according to a potential of the node in a stationary state
when the signal current is supplied to the driven circuit.
15
3. The current drive circuit according to claim 1,
wherein the precharge means comprises a plural setting means for setting a plurality of
the precharge voltages; and
a selection supply means for selectively supplying the precharge voltage to the node and
20 the signal line according to a magnitude of the signal current.
4. A current drive circuit which supplies a signal current to a node of a driven circuit
through a signal line, comprising:
a precharge circuit for supplying a precharge voltage to the node and the signal line;
25 a generation means for supplying the signal current to the precharge circuit and
generating the precharge voltage; and
a supply means for supplying the precharge voltage to the node and the signal line prior
to supplying the signal current to the driven circuit.
- 30 5. A current drive circuit which supplies a signal current to a node of a driven circuit
through a signal line, comprising:
a precharge circuit for supplying a precharge voltage to the node; and

a supply means for generating the precharge voltage in advance by supplying a current corresponding to the signal current to the precharge circuit and then supplying the precharge voltage to the node and the signal line prior to supplying the signal current to the driven circuit.

5

6. The current drive circuit according to claims 4 or 5,
wherein the driven circuit comprises a first driving element and the precharge circuit comprises a second driving element; and
the first and the second driving elements are the same in size or in size according to it.

10

7. The current drive circuit according to claims 4 or 5, comprising:
a means for supplying the precharge voltage to the node and the signal line through an impedance transformation amplifier.

15

8. The current drive circuit according to claims 4 or 5, comprising:
a plural setting means for setting a plurality of the precharge voltages; and
a selection supply means for selectively supplying the precharge voltage to the node and the signal line according to a magnitude of the signal current.

20

9. The current drive circuit according to any one of claims 1, 4, or 5, comprising:
a means for setting a precharge period T_b for supplying the precharge voltage to the node and the signal line so as to satisfy

$$T_b = R_L \times C_L$$

based on a wiring resistance R_L and a parasitic capacitance C_L of the signal line.

25

10. The current drive circuit according to claim 9, comprising:

a means for setting as

$$T_a = T_b$$

in the case where a supply period T_a of the signal current to the driven circuit satisfies

30

$$T_a < T_b.$$

11. A display device comprising:

an image circuit to which an image data is provided as a current through a current line;
and

a current drive circuit for supplying the image data to the current line as a signal current,
5 wherein the current drive circuit comprising:

a source driver current source for supplying a signal current according to the image data
from a node to the current line;

a precharge circuit for supplying a precharge voltage to the node and the current line;
and

10 a supply means for supplying the precharge voltage to the node and the current line
prior to supplying the signal current.

12. The display device according to claim 11, comprising:

a means for supplying the precharge voltage to the current line through an impedance
15 transformation amplifier.

13. A display device comprising:

a pixel circuit comprising a signal line for transmitting image data as a signal current
and a first driving element for supplying a driving current in proportion to the signal current
20 from a power supply line; and

a source driver circuit comprising an image signal input current source for supplying the
signal current to the signal line,

wherein a precharge circuit for precharging the signal line prior to supplying the signal
current to the signal line is integrated in the source driver circuit.

25

14. The display device according to claim 13,

wherein the precharge circuit is selectively connected between the image signal input
current source and the power supply line and comprises a second driving element for
outputting a precharge voltage according to the signal current.

30

15. The display device according to claims 13 or 14, comprising:

a means for supplying the precharge voltage to the signal line through an impedance

transformation amplifier.

16. A display device comprising:

5 a pixel circuit comprising a signal line for transmitting image data as a signal current
and a first driving element for supplying a driving current in proportion to the signal current
from a power supply line; and

a source driver circuit comprising an image signal input current source for supplying the
signal current to the signal line,

10 wherein a precharge circuit for precharging the signal line prior to supplying the signal
current to the signal line is integrated in the source driver circuit;

the precharge circuit is selectively connected between the image signal input current
source and the power supply line and comprises a second driving element for outputting a
precharge voltage according to the signal current; and

15 the first and the second driving elements are the same in size or in size according to it.

17. The display device according to claims 13 or 16, comprising:

a means for setting the precharge voltage to a value equal to or according to a voltage in
a stationary state when the signal current is supplied to the first or the second driving
element.

20

18. A current drive circuit comprising:

a driven circuit;

a precharge circuit;

a means for controlling a connection between a driven circuit and a precharge circuit;

25 and

a means for controlling a connection between a driven circuit and a current source
circuit.

19. A current drive circuit comprising:

30 a driven circuit;

a precharge circuit;

a current source circuit for inputting a signal current to the driven circuit;

a means for controlling a connection between the driven circuit and the precharge circuit;

a means for controlling a connection between the driven circuit and the current source circuit; and

5 a means for outputting a voltage by amplifying a signal outputted from the precharge circuit.

20. A current drive circuit comprising:

a driven circuit;

10 a precharge circuit;

a current source circuit for inputting a signal current to the driven circuit;

a means for controlling a connection between the driven circuit and the precharge circuit;

15 a means for controlling a connection between the driven circuit and the current source circuit, wherein

the precharge circuit outputs a precharge voltage selected from a plurality of voltage values.

21. A current drive circuit comprising:

20 a driven circuit;

a precharge circuit;

a current source circuit for inputting a signal current to the driven circuit;

a means for controlling a connection between the driven circuit and the precharge circuit;

25 a means for controlling a connection between the driven circuit and the current source circuit; and a means for amplifying a signal outputted from the precharge circuit,

wherein the precharge circuit outputs a precharge voltage selected from a plurality of voltage values.

30 22. The current drive circuit according to any one of claims 18 to 21,

wherein the driven circuit comprises a first transistor and the precharge circuit comprises a second transistor.

23. The current drive circuit according to claim 22,
wherein a proportion of a channel width W and a channel length L of the first transistor
and a proportion of a channel width W and a channel length L of the second transistor are
5 almost equal to each other.
24. The current drive circuit according to any one of claims 18 to 21, comprising:
a means for setting a precharge period T_b for supplying the precharge voltage to the
wiring, a resistance R_L of the wiring, and a parasitic capacitance C_L so as to satisfy
10 $T_b = R_L \times C_L$.
25. The current drive circuit according to any one of claims 18 to 21, comprising:
a means for driving the driven circuit with a binary signal voltage.
- 15 26. The current drive circuit according to any one of claims 18 to 21,
wherein the driven circuit is disposed in a pixel of a display device; and
the precharge circuit and the current source circuit are disposed in a source driver circuit
of the display device.
- 20 27. The current drive circuit according to any one of claims 18 to 21,
wherein the driven circuit is disposed in a digital voltage/analog current conversion
circuit; and
the precharge circuit and the current source circuit are disposed in a reference current
source circuit.
- 25 28. The current drive circuit according to any one of claims 18 to 21,
wherein the precharge circuit comprises a transistor; and
a gate and a drain of the transistor are connected to each other.